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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/670,518	09/26/2003	Toshiya Uemura	F03-366-USdiv	F03-366-USdiv 6487	
21254	7590 11/01/2004		EXAMINER		
MCGINN & GIBB, PLLC			PHAM, LONG		
8321 OLD CO SUITE 200	OURTHOUSE ROAD	•	ART UNIT PAPER NUMBER		
VIENNA, VA	A 22182-3817		2814	2814	
			DATE MAILED: 11/01/2004		

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)				
	10/670,518	UEMURA ET AL.				
Office Action Summary	Examiner	Art Unit	W			
	Long Pham	2814	10.			
The MAILING DATE of this communication app Period for Reply	pears on the cover sheet with the c	orrespondence ad	dress			
A SHORTENED STATUTORY PERIOD FOR REPL' THE MAILING DATE OF THIS COMMUNICATION.  - Extensions of time may be available under the provisions of 37 CFR 1.1 after SIX (6) MONTHS from the mailing date of this communication.  - If the period for reply specified above is less than thirty (30) days, a repl - If NO period for reply is specified above, the maximum statutory period - Failure to reply within the set or extended period for reply will, by statute Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	36(a). In no event, however, may a reply be time y within the statutory minimum of thirty (30) day will apply and will expire SIX (6) MONTHS from a cause the application to become ABANDONE	nely filed s will be considered timely the mailing date of this co D (35 U.S.C. § 133).	y. ommunication.			
Status						
1) Responsive to communication(s) filed on	<b></b> •					
2a) This action is <b>FINAL</b> . 2b) ☐ This	action is non-final.					
, ,	) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.					
Disposition of Claims						
4)  Claim(s) 15-26 is/are pending in the application.  4a) Of the above claim(s) is/are withdrawn from consideration.  5)  Claim(s) is/are allowed.  6)  Claim(s) 15-20 and 22-26 is/are rejected.  7)  Claim(s) 21 is/are objected to.  8)  Claim(s) are subject to restriction and/or election requirement.						
Application Papers						
9) ☐ The specification is objected to by the Examine 10) ☑ The drawing(s) filed on 26 September 2003 is Applicant may not request that any objection to the Replacement drawing sheet(s) including the correct 11) ☐ The oath or declaration is objected to by the Example 2003.	are: a)⊠ accepted or b)⊡ objec drawing(s) be held in abeyance. See tion is required if the drawing(s) is ob	e 37 CFR 1.85(a). jected to. See 37 CF	FR 1.121(d).			
Priority under 35 U.S.C. § 119						
12) Acknowledgment is made of a claim for foreign a) All b) Some * c) None of:  1. Certified copies of the priority document 2. Certified copies of the priority document 3. Copies of the certified copies of the priority application from the International Burea * See the attached detailed Office action for a list	is have been received. Is have been received in Applicati In rity documents have been receive In (PCT Rule 17.2(a)).	on No ed in this National	Stage			
Attachment(s)						
<ol> <li>Notice of References Cited (PTO-892)</li> <li>Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)</li> <li>Paper No(s)/Mail Date 09/26/03.</li> </ol>	4) Interview Summary Paper No(s)/Mail Di 5) Notice of Informal F 6) Other:	ate	O-152)			

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### **DETAILED ACTION**

### General Information

Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <a href="http://www.uspto.gov/ebc/index.html">http://www.uspto.gov/ebc/index.html</a> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

# Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
- 2. Claims 15, 16, 17, 18, 19, 20, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al. (US 5,563,422).

With respect to claims 15, 16, 17, 18, 19, 20, and 22, Nakamura et al. teach a method of manufacturing a light-emitting semiconductor device of Group III nitride compound semiconductor with p-type conduction, said method comprising (see col. 17 of Nakamura et al.): providing a surface layer;

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forming a multi-layered electrode layer comprising of a first electrode layer of Ni formed on said surface layer and a second electrode layer of Au formed said first electrode layer, said first electrode layer comprising of a material or Ni having ionization potential lower than that of said second electrode layer and said second electrode layer comprising of a material or Au having an ohmic characteristic to said semiconductor better than that of said first electrode layer;

forming an electrode pad covering (aluminum) a portion of said second electrode layer and leaving another portion of said second electrode layer uncovered; and

providing a heat treatment so that the portion of said material of said second electrode layer which is uncovered by said electrode pad is distributed more deeply into said surface layer than that of said first electrode layer and provides a contact resistance between said electrode layer and said surface layer lower than said portion covered with said electrode pad.

With respect to claim 19, Nakamura et al. further teach the Group III nitride compound semiconductor satisfies the formula  $Al_xGa_yIn_{1-x-y}N$ , wherein  $0 \le x \le 1$ ,  $0 \le y \le 1$ , and  $0 \le x + y \le 1$ . See col. 17 of Nakamura et al.

With respect to claim 20, since Nakamura et al. teach the claimed method, the material of the second electrode layer inherently would not permeate into the first electrode layer immediately under the electrode pad, which inherently enables the interface between the electrode and the semiconductor immediately under the electrode pad to have a predetermined large resistivity and not to have an electric current pass therethrough.

## Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 23, 24, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 5,563,422).

With respect to claims 23 and 25, Nakamura et al. fail to teach the inclusion of a third metal layer of AI, Ni, or Ti.

However, the inclusion of a metal layer of Al, Ni, or Ti is well-known to one of ordinary skill in the art of making semiconductor devices.

With respect to claim 24, Nakamura et al. fail to teach the inclusion of a protective layer of SiO<sub>2</sub>.

However, the inclusion of a protective layer of SiO<sub>2</sub> is well-known to one of ordinary skill in the art of making semiconductor devices.

With respect to claim 26, Nakamura et al. fail to teach that the annealing is done in presence of oxide.

However, the annealing in the presence of oxide is well-known to one of ordinary skill in the art of making semiconductor devices.

### Allowable Subject Matter

5. Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Long Pham

**Primary Examiner** 

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